in the more sterile areas of the plateau and barrancas. I have not seen either of these collections, but I suspect that both represent A. seriphioides. The type specimen of Lippia foliolosa, which is R. A. Philippi 178, deposited in the herbarium of the Botanisches Museum at Berlin, was photographed there by Macbride as his type photograph number 17507, but is now destroyed.

Lorentz & Niederlein (1881) and Muñoz Pizarro (1960) erroneously refer to "Lippia foliosa" instead of L. foliolosa of Philippi. The latter author cites the herbarium numbers 42416 and 54803 in the Santiago, Chile, herbarium.

Houard (1933) describes the gall which is commonly found on this plant as follows: "A l'extrémité d'une tige ou à l'aisselle d'une pousse latérale....., cécidie ovoïdale ou subsphérique, de 3 mm. de long sur 2—3 mm. de large, terminée par une ou deux petites pointes à peine visibles ou bien par des restes de feuilles. Surface finement et courtement velue, verte ou rouge, plus tard grise. Paroi très mince; cavité larvaire unique avec trou d'éclosion latéral. M. C., sand cocon; adulte fin septembre—début d'octobre...Misospatha lippiae Kieff. et Jörgensen."

Additional citations: ARGENTINA: Buenos Aires: O'Donell 1447 (W—2049674); Orbea s.n. [Herb. Inst. Bot. Darwin. 18755] (W—2196450). Chubut: Sleumer 1482 (W—2056046). La Pampa: H. H. Bartlett 19936 (Au—195006, W—1904766, W—2056266); Troncoso s. n. [Herb. Inst. Bot. Darwin. 20504] (W—2340703). Mendoza: H. H. Bartlett 19193 (W—1904389), 19430 (W—1904496), 19464 (W—1904516); Lourteig 755 [Herb. Inst. Miguel Lillo 114002] (Ca); O'Donell 1051 (Ca—165394); R. A. Philippi 178 [Macbride photos 17507] (N—photo, W—photo); Sleumer 319 (B). Neuquen: Fabris 822 (W—2144766). Rio Negro: W. Fischer 12 (W—704174). San Luis: Pastore 2074 (Ca—3310). Santa Cruz: Dusén 20 (W—1133921); Ferrando 3817 (Ca—3373); Sleumer 1103 (W—2055882). Province undetermined: Kuntze s.n. [Pampas Reise, Januar 1892] (W—701565).

ACANTHOLIPPIA TRIFIDA (C. Gay) Moldenke

Emended synonymy: Lippia trifida Clos ex R. A. Phil., Anal. Univ. Chile 27: 350, in syn. 1865 [not L. trifida R. A. Phil., 1860]. Lippia trifida Remy ex F. Phil., Cat. Pl. Vasc. Chil. 218. 1881.

Additional & emended bibliography: R. A. Phil., Anal. Univ. Chile 27: 350 (1865) and 35: 193. 1870; F. Phil., Cat. Pl. Vasc. Chil. 218. 1881; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 2: 96. 1894; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 250. 1903; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 415. 1913; Hicken, Physis 2: 114. 1916; Molfino, Physis 5: 21. 1921; Stapf, Ind. Lond. 4: 125. 1930; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 250. 1941; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 2: 96. 1946; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 36—38, fig. 1A. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 2. 1953; Acevedo de Vargas, Biol. Abstr. 28: 904. 1954;

Hocking, Dict. Terms Pharmacog. 128. 1955; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 250. 1959; G. Taylor, Ind. Kew. Suppl. 12: 7. 1959; Muñoz Pizarro, Espec. Plant. Descr. Philippi 110. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 2: 96. 1960; Moldenke, Phytologia 7: 336—338. 1961.

Illustrations: Sanzin, Anal. Soc. Cient. Argent. 88: 101. 1919; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 36, fig. 1A. 1951.

Acevedo de Vargas (1951) avers that this plant is an Aloysia and calls it Aloysia gracilis. It is mentioned by Hauman-Merck (1913) as "Lippia trifida Gay" and he cites his no. 355 which he says represents plants "isolated in a more sterile area of the plateau and barrancas" of Rio Negro, Argentina. This is most surely a misidentification. The plant referred to by him was probably A. seriphioides (A. Gray) Moldenke. Philippi (1865) refers to Lippia trifida Clos in synonymy, which he says is his Lippia microphylla, now called Acantholippia deserticola (R. A. Phil.) Moldenke. The Philippi (1896) reference in the bibliography, by the way, is often cited as "1895" [e.g., by Durand & Jackson (1903)], while the Molfino (1921) reference was mis-cited as volume "9" in Phytologia 7: 336 (1961). Hicken (1916) cites A. trifida from Tarapacá in Chile and from Mendoza, San Luis, and Rio Negro in Argentina, but I think that these records are all based on misidentifications. I know the species only from Atacama, Chile. The vernacular name, "tomillo", has been recorded for it. Hocking (1955) reports that the herbage is rich in thymol. An isotype of A. trifida, C. Gay s.n., deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva, was photographed there by Macbride as his type photograph number 24673.

The I. M. Johnston 4850 & 4877, distributed as Lippia trifida, are actually Aloysia fonckii (R. A. Phil.) Moldenke, while Werdermann 184 is Aloysia reichii Moldenke.

Additional citations: CHILE: Atacama: C. Gay s.n. [Macbride photos 24673] (W—photo of isotype).

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ADDITIONAL NOTES ON THE GENUS AVICENNIA. IV

Harold N. Moldenke

AVICENNIACEAE Endl.

Additional synonymy: Avicenniaceae (Endl.) Schnitzl. apud Airy-Shaw in Willis, Dict. Flow. Pl., ed. 7, 109. 1966.

Additional & emended bibliography: Adans., Fam. Pl. 2: 12, 200, & 201. 1763; H.B.K., Nov. Gen. & Sp. Pl., ed. folio, 2: 228—230 (1817) and ed. quart., 2: 283—285. 1818; A. Cunn., Ann. Nat. Hist., ser. 1, 1: 461. 1838; D. Dietr., Syn. Pl. 3: 372 & 619.

1843; Benth., Bot. Voy. Sulphur 155. 1846; Aschers. in Schweinf., Beitr. Fl. Aethiop. 1: 118 & 278. 1867; A. Gray, Syn. Fl. N. Am., ed. 1, 2 (1): 334 & 340—341. 1878; Boiss., Fl. Orient. 4: 536—537. 1879; A. Gray, Syn. Fl. N. Am., ed. 2, 2 (1): 334 & 340—341. 1886; Barnhart, Bull. Torrey Bot. Club 29: 590. 1902; Prain, Beng. Pl., ed. 1, 2: 824 & 838. 1903; Volkens, Notizbl. Bot. Gart. Berl. 5, App. 22 (2): 35—36. 1909; Craib, Contrib. Fl. Siam Dicot. 168. 1912; Bournot, Arch. Pharm. 251: 351. 1913; R. T. Baker, Journ. & Proc. Rot. Soc. N. S. Wales 49: 257—281, pl. 27—48. 1915; Haines, Bot. Bihar & Orissa 4: 704 & 724—725. 1922; Gamble, Fl. Presid. Madras 6: 1086 & 1105—1106. 1924; H. J. Lam in Engl., Bot. Jahrb. 59: 29. 1924; J. G. Wats., Malay. Forest. Rec. 6: 1, 3, 56—69, 99, 101, 114—118, 128, 135, 137, 150, 178, & 192, pl. 2, 26—33, & 47. 1928; Watt & Breyer-Brandwijk, Med. & Poison. Pl. S. Afr., ed. 1, 155. 1932; V. J. Chapm., Proc. Linn. Soc. Lond. 152: 228—233, fig. 1—4. 1940; Cramwell, Rec. Auckl. Inst. & Mus. 2: 296. 1942; Trochain, Trav. Toulous. Univ. Lab. Forest. 1 [Art. Divers.] 3 (19): 1—11. 1942; Trochain & Dulau, Bull. Toulous. Soc. Hist. Nat. 77: 271—281. 1942; J. H. Willis, Victorian Nat. 61: 40—41. 1944; Erdtman, Svensk Bot. Tidsk. 39: 282 & 283, fig. 2. 1945; J. Hutchinson, Botanist in South. Afr. 553. 1946; Bharucha & Shirke, Journ. Bombay Univ. B, new ser., 15 (5): 1—14. 1947; Frison, Bull. Agr. Congo Belg. 39: 587—592. 1948; Faegri & Iversen, Text-book Mod. Pollen Analys. 194 & 219. 1950; Lombardo, Invent. Pl. Cult. Montevid. [10]. 1954; Angely, Fl. Paran. 7: 6—8. 1957; Anon., U. S. Dept. Agr. Bot. Subj. Index 15: 14353. 1958; Karrer, Konstit. & Vork. Organ. Pflanzenst. 489. 1958; Aubrev., Fl. For. Cot. Iv., ed. 2, 3: 234, pl. 338. 1959; Moldenke, Biol. Abstr. 33: 3171 (1959) and 35: 983 & 2177. 1960; Angely, Liv. Gen. Bot. Bras. 8. 1960; Allan, Fl. N. Zeal. 1: 960—961. 1961; M. R. Henderson, Common Malay. Wildfls. 39. 1961; Angely, Fl. Paran. 17: 10, 11, & 15. 1961; Moldenke, Biol. Abstr. 36: 2843 (1961) and 40: 250 & 1560. 1962; Cuf., Bull. Jard. Bot. Brux. 32: Suppl. 803. 1962; Angely, Fl. Bacia Paran. 22: 25. 1962; Watt & Breyer-Brandwijk, Med. & Poison. Pl. S. Afr., ed. 2, 1047 & 1360. 1962; Hocking, Excerpt. Bot. A.4: 591 (1962). A.5: 45 (1962), and A.6: 454. 1963; Prain, Bengal Pl., ed. 2, 2: 626 & 1009. 1963; Moldenke, Biol. Abstr. 42: 1517. 1963; Soukup, Biota 4: 320 (1963) and 5: 194. 1964; Hocking, Excerpt. Bot. A.8: 190. 1964; Angely, Bibl. Veg. Paran. 195 & 197. 1964; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Bull. 15: 23. 1964; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1963: 9. 1964; Van Steenis, Fl. Males. Bull. 19: 1203. 1964; C. J. Lyon, Biol. Abstr. 45: 8025. 1964; Klein, Anais XV Congr. Soc. Bot. Bras. 260. 1964; H. D. Jordan, Journ. Appl. Ecol. 1: 209—212. 1964; Anon., Biol. Abstr. 45 (23): B.13, B.14, B.116, B.117, B.125, B.127, & B.129 (1964) and 46 (3): B.14, B.118, B.121, & B.131. 1965; R. C. Cook, Leaders Am. Sci., ed. 6, 414. 1965; Gooding, Loveless, & Proctor, Fl. Barbados 365 & 465. 1965; Naurois & Roux, Bull. Inst. Fr. Afr. Noire A.27: 854. 1965; Anon., Assoc. Etud. Fl. Afr. Trop. Index 1964: 10. 1965; Hocking, Excerpt. Bot. A.8: 227. 1965; D. R. Harris, Univ. Calif. Publ. Geogr. 18: [Pl. Anim. & Man Outer Leeward Isls.]

143. 1965; Moldenke, Phytologia 12: 6. 1965; Moldenke, Biol. Abstr. 46 (1): 1012. 1965; Datta, Handb. Syst. Bot. 181, 183, 339, 360, & 411. 1965; Humbert, Trav. Sect. Scient. & Tech. Inst. Franç. Pond. Hors Ser. 6: 77. 1965; Arora & Aggarwal, Journ. Indian Bot. Soc. 44: 317, 318, 323, & 325. 1965; Schnell, Adansonia 5: 322—326, pl. 1 & 2. 1965; Biebel & Kinzel, Oesterr. Bot. Zeit. 112: 56—93. 1965; Maheshwari & Singh, Dict. Econ. Pl. India 18. 1965; Gaussen & al., Trav. Sect. Scient. & Tech. Inst. Franç. Pond. Hors Ser. 7: 78 & 96. 1966; Airy-Shaw in Willis, Dict. Flow. Pl., ed. 7, 109, 146, 375, 515, 546, 948, 1009, & 1165. 1966; Hemming, Proc. Linn. Soc. Lond. Bot. 177 (2): 235. 1966; Bowman, Galap. 192 & 301. 1966; Tanabe, Pl. Jap. Environ. 1: 2. 1966; Riegel, Diss. Abstr. 26: 6648—6649. 1966; Studholme & Philipson, New Zeal. Journ. Bot. 4: 355—365. 1966; C. A. Sm., Common Names S. Afr. Pl. 332, 500, & 600. 1966; H. P. French, Ibis 108: 423—424. 1966; Gómez Pompa, Estud. Bot. Reg. Misantla 93. 1966; Braga de Andrade, Univ. São Paulo Fac. Filos. Bol. 305, Bot. 22: 34. 1966; T. C. Whitmore, Guide Forests Brit. Solomon Isls. 21. 1966; Anon., Biol. Abstr. 47 (23): S.17. 1966; Stace, New Phytol. 65: 304--318. 1966; Stace, Biol. Abstr. 47: 9875. 1966; Rao, Aggarwal, & Mukherjee, Bull. Bot. Surv. India 8: 61, 62, 65, & 66. 1966; Erdtman, Pollen Morph. & Pl. Tax. 448. 1966; G. L. Davis, Syst. Embryol. Angiosp. 271—272. 1966; Anon., Assoc. Etud. Tax. Fl. Afr. Trop. Index 1966: 9. 1967; W. G. Burger, Fam. Flow. Pl. Ethiop. 116. 1967; Van Steenis-Kruseman, Fl. Malcs. Bull. 4: xlix. 1967; J. Jiménez, Archiv. Bot. & Biogeog. Ital. 43: 4. 1967; Moldenke, Phytologia 15: 71—72. 1967; Moldenke, Résumé Suppl. 15: 1, 2, 4—6, 8, & 16. 1967; Jamieson & Reynolds, Trop. Pl. Types 159, fig. 87. 1967; Riegel, Biol. Res. Ind. Tit. 1967: 2291. 1967; Kroha, Biol. Abstr. 48: 6872. 1967; Anon., Biol. Abstr. 48 (15): S.18 & S.177. 1967; Studholme & Philipson, Biol. Abstr. 48: 645. 1967; Jordan, Biol. Abstr. 48: 383. 1967; R. P. French, Biol. Abstr. 48: 1482; Sauer, Plants & Man Seychelles 84, 89, & 102. 1967.

It is worthy of note that in the bibliography given above this family is accepted as a valid one by many authors. Even Ascherson (1867) and Cufodontis (1962) recognize it. Burger (1967) states that it differs from the Verbenaceae in the structure of the ovary and in its seaside habit (which is not strictly true, since Clerodendrum inerme and Vitex trifolia var. simplicifolia also have a characteristic "seaside habit"; however, they do not grow in the mangrove swamps as characteristically as does Avicennia, nor do they possess the unusual wood structure of the latter genus). Airy-Shaw (1966) characterizes the Avicenniaceae as follows: "Dicots 2/15 trop. coasts. Shrubs or small trees, often greyish or yellow tomentose. Lvs. opp., simple, ent., exstip. Infl. cymose or thyrsif., condensed or spicif., term. and axill., bracteata. Fls. small, yellowish, reg., ♀ (5) imbr.; C (4), imbr.; A 4; G (4), with 1-ovulate imperf. loc. and short bifid style. Fr. a broad compr. ovoid or spher. bivalved 1-seeded caps. Only genus Avicennia. Perhaps related to Salvadoraceae."

AVICENNIA L.

Additional & emended synonymy: Donatia Loefl., Iter Hisp. 193, in syn. 1758 [not Donatia Bert., 1849, nor J. R. & G. Forst., 1776]. Halodendron Roem. & Schult., Syst. Veg. 3: 485. 1818 [not Halodendron P. DC., 1825]. Bontia P. Br. ex Airy-Shaw in Willis, Dict. Flow. Pl., ed. 7, 146. 1966.

The Lam (1924) reference in the bibliography of this group is sometimes cited as "1925", but the latter date is merely the title page date for the volume; the page in question appeared in 1924. The Boissier (1879) reference is often dated "1875", but only pages 1--280 were issued in 1875; pp. 281--1276 did not appear in print until 1879. The J. G. Watson (1928) reference in the bibliography is often cited as "J. G. Wats., Mangrove Forests Malay Penins." The H.B.K. reference dates have been authenticated by Barnhart (1902).

Airy-Shaw (1966) correctly places this genus in the family Avicenniaceae, and says that there are 14 species in the genus, inhabiting warm regions, constituents of mangrove vegetation; they have aerial roots projecting out of the mud like Sonneratia; the seeds germinate in the fruit. He regards Bontia L. as strictly a genus in the Myoporaceae, not distinguishing between the "Bontia L." of 1735 and that of 1758.

The Donatia of Bertero, referred to in the synonymy above, is actually a synonym of Lastarriaea in the Polygonaceae, while that of the Forsters is the type genus of the Donatiaceae, and the Halodendron of DeCandolle is a synonym of Halimodendron Fisch. in the Fabaceae.

AVICENNIA AFRICANA P. Beauv.

Additional bibliography: Volkens, Notizbl. Bot. Gart. Berl. 5, App. 22 (2): 35--36. 1909; Trochain & Dulau, Trav. Toulous. Univ. Lab. Forest. 1 [Art. Divers.] 3 (19): 1--11, fig. 1. 1942; Trochain & Dulau, Bull. Toulous. Soc. Hist. Nat. 77: 271--281. 1942; Frison, Bull. Agr. Congo Belg. 39: 587--592. 1948; Anon., U. S. Dept. Agr. Bot. Subj. Index 15: 14353. 1958; Jordan, Journ. Appl. Ecol. 1: 209--212. 1964; Schnell, Adansonia 5: 324--326. 1965; Erdtman, Pollen Morph. & Pl. Tax. 448. 1966; Jamieson & Reynolds, Trop. Pl. Types 159. 1967; Jordan, Biol. Abstr. 48: 383. 1967; Moldenke, Phytologia 15: 71. 1967; Moldenke, Résumé Suppl. 15: 5 & 6. 1967.

Additional illustrations: Trochain & Dulau, Trav. Toulous. Univ. Lab. Forest. 1 [Art. Divers.] 3 (19): 5, fig. 1. 1942.

Erdtman (1966) examined the pollen of Afzelius s.n. from Sierra Leone and found it to be (2)--3-colporoidate, 32 x 26 mu, the sexine reticulate, as thick as the nexine. In A. germinans he found the grain to be 39 x 29 mu, with the sexine considerably thicker than the nexine.

AVICENNIA ALBA Blume

Additional & emended bibliography: Prain, Beng. Pl., ed. 1, 2:

838. 1903; Haines, Bot. Bihar & Orissa 4: 725. 1922; Gamble, Fl. Presid. Madras 6: 1105 & 1106. 1924; J. G. Wats., Malay. Forest Rec. 6: 61, 62, 67, 69, 116, 118, & 150, pl. 30 & 31. 1928; Prain, Bengal Pl., ed. 2, 2: 626. 1963; Moldenke, Phytologia 15: 71. 1967; Moldenke, Résumé Suppl. 15: 8 & 16. 1967.

Emended illustrations: J. G. Wats., Malay. Forest Rec. 6: pl. 30 & 31. 1928.

Additional citations: THAILAND: Hansen & Smitinand 12313 (Cp, Rf).

AVICENNIA GERMINANS (L.) L.

Emended synonymy: Avicennia tomentosa var. cumanensis H.B.K., Nov. Gen. & Sp. Pl., ed. folio, 2: 229--230. 1817. Avicennia tomentosa var. campechensis H.B.K., Nov. Gen. & Sp. Pl., ed. folio, 2: 230. 1817. Avicennia tomentosa var. guayaquilensis H.B.K., Nov. Gen. & Sp. Pl., ed. folio, 2: 230--231. 1817.

Additional & emended bibliography: H.B.K., Nov. Gen. & Sp. Pl., ed. folio, 2: 229--231 (1817) and ed. quart., 2: 283--285. 1818; A. Cunn., Ann. Nat. Hist., ser. 1, 1: 461. 1838; A. Gray, Syn. Fl. N. Am., ed. 1, 2 (1): 341 (1878) and ed. 2, 2 (1): 341. 1886; Barnhart, Bull. Torrey Bot. Club 29: 590. 1902; Bournot, Arch. Pharm. 251: 351. 1913; V. J. Chapm., Proc. Linn. Soc. Lond. 152: 228--233, fig. 1--4. 1940; Trochain & Dulau, Trav. Toulous. Univ. Lab. Forest. 1 [Art. Divers.] 3 (19): 1--11. 1942; Trochain & Dulau, Bull. Toulous. Soc. Hist. Nat. 77: 271--281. 1942; V. J. Chapm., Journ. Linn. Soc. Lond. 52: 407--534, text figs. 1--169, fig. 1--3, pl. 16--20. 1944; Karrer, Konstit. & Vork. Organ. Pflanzenst. 489. 1958; Jordan, Journ. Appl. Ecol. 1: 209--212. 1964; Schnell, Adansonia 5: 322--326, pl. 1 & 2. 1965; Bieble & Kinzel, Oesterr. Bot. Zeit. 112: 56--93. 1965; D. R. Harris, Univ. Calif. Publ. Geogr. 18: [Pl. Anim. & Man Outer Leeward Isls.] 52 & 143. 1965; Erdtman, Pollen Morph. & Pl. Tax. 448. 1966; Gómez Pompa, Estud. Bot. Reg. Misantla 93. 1966; Moldenke, Phytologia 15: 72. 1967; Moldenke, Résumé Suppl 15: 1, 2, 4, & 16. 1967; Jamieson & Reynolds, Trop. Pl. Types 159. 1967; Kroha, Biol. Abstr. 48: 6872. 1967; Anon., Biol. Abstr. 48 (15): S.18 & S.177. 1967; Jordan, Biol. Abstr. 48: 383. 1967.

Additional illustrations: V. J. Chapm., Proc. Linn. Soc. Lond. 152: 229 & 232, fig. 1--4. 1940; Schnell, Adansonia 5: 322 & 323, pl. 1 & 2. 1965.

Bournot (1913) reports the presence of lapachol, $C_{15}H_{14}O_3$, in this species. Erdtman (1966) examined the pollen of Gaumer 619 from Mexico and found it (2)--3-colporoidate, 39 x 29 mu, the sexine reticulate, considerably thicker than the nexine. In A. africana he found the grains to be only 32 x 26 mu, with the sexine merely as thick as the nexine.

Wiggins & Porter describe A. germinans as it occurs on the Galapagos Islands as an arborescent shrub, 2.5--4 m. tall, with a flattened crown, or a tree, 6 m. tall near the beach, but taller inland around the lagoons, with a smooth to flaky brownish-gray

bark on a trunk to 30 cm. in diameter. Harris (1965) reports that "all 4 New World mangroves" grow on the leeward coasts of Antigua, Barbuda, and Anguilla. Gómez Pompa (1966) reports the species as growing along with Brosimum in Mexico.

It should be noted that the H.B.K. reference dates given in the emended synonymy and in the bibliography above have been authenticated by Barnhart (1902).

Additional citations: FLORIDA: Indian River Co.: Curtiss 1972 [fls. July] (Ms--7205, Ms--30957), 1972 [fr. Sept.] (Ms--7205, Ms--30957). Manatee Co.: Nash 2450 (Ms--30958). County undetermined: A. P. Garber s.n. [Florida, 1877] (Ms--30956). GALAPAGOS ISLANDS: Albemarle: Wiggins & Porter 216 (Ac). Charles: Wiggins & Porter 517 (Rf). James: Wiggins & Porter 287 (Rf). Narborough: Wiggins & Porter 199 (Ac), 201 (Rf).

AVICENNIA LANATA Ridl.

Additional & emended bibliography: J. G. Wats., Malay. Forest Rec. 6: 63, 64, 67, 69, 99, 101, & 117, pl. 32 & 33. 1928; Moldenke, Phytologia 14: 328. 1967.

Additional illustrations: J. G. Wats., Malay. Forest Rec. 6: pl. 32 & 33. 1928.

AVICENNIA MARINA (Forsk.) Vierh.

Additional synonymy: Avicennia tomentosa Wall. ex Boiss., Fl. Orient. 4: 536--537, in syn. 1875. Avicennia marina Vierh. ex Moldenke, Résumé 235, in syn. 1958; C. A. Sm., Common Names S. Afr. Pl. 600. 1966.

Additional & emended bibliography: Boiss., Fl. Orient. 4: 536--537. 1879; R. T. Baker, Journ. & Proc. Roy. Soc. N. S. Wales 49: 257--381, pl. 27--48. 1915; Gamble, Fl. Presid. Madras 6: 1105 & 1106. 1924; J. G. Wats., Malay. Forest Rec. 6: 3, 59, 60, 66, 68, 101, 115--118, & 137, pl. 2, 28, 29, & 47. 1928; Watt & Breyer-Brandwijk, Med. & Poison. Pl. S. Afr., ed. 1, 155. 1932; Trochain & Dulau, Trav. Toulous. Univ. Lab. Forest. 1 [Art. Divers.] 3 (19): 6. 1942; J. H. Willis, Victorian Nat. 61: 40--41. 1944; Allan, Fl. N. Zeal. 1: 961. 1961; Watt & Breyer-Brandwijk, Med. & Poison. Pl. S. Afr., ed. 2, 1047 & 1360. 1962; Humbert, Trav. Sect. Scient. & Tech. Inst. Franç. Pond., ser. 6, Not. Carte Madag. 77. 1965; Hemming, Proc. Linn. Soc. Lond. Bot. 177 (2): 235. 1966; Tanabe, Pl. Jap. Environ. 1: 2. 1966; Erdtman, Pollen Morph. & Pl. Tax. 448. 1966; C. A. Sm., Common Names S. Afr. Pl. 332, 500, & 600. 1966; G. L. Davis, Syst. Embryol. Angiosp. 271. 1966; Moldenke, Phytologia 15: 72. 1967; Moldenke, Résumé Suppl. 15: 16. 1967.

Additional illustrations: J. G. Wats., Malay. Forest Rec. 6: pl. 2, 28, 29, & 47. 1928; Tanabe, Pl. Jap. Environ. 1: 2 [in color]. 1966.

The Boissier reference (1879) in the synonymy and bibliography above is sometimes cited as "1875", but the pages indicated were not actually published until 1879. It should also be noted here that the "A. officinalis Auct." of Allan is actually A. marina

var. resinifera (Forst.) Bakh.

Erdtman (1966) misidentifies this species as A. officinalis and describes its pollen as 3-colporate, spheroidal (33 mu); the sexine as thick as the nexine (cf. retipilariate). He bases this description on the pollen of Schlieben 5787 from Tanganyika.

Additional citations: PORTUGUESE EAST AFRICA: Mozambique: Torre & Paiva 11484 (Z). THAILAND: Hansen & Smitinand 12310 (Cp, Rf); Larsen, Smitinand, & Warncke 1220 (Rf).

AVICENNIA MARINA var. ACUTISSIMA Stapf & Moldenke

Additional synonymy: Avicennia marina var. acutissima Stapf & Moq. ex Rao, Aggarwal, & Mukherjee, Bull. Bot. Surv. India 8: 65, sphalm. 1966.

Additional bibliography: Moldenke, Phytologia 7: 225--226. 1960; Rao, Aggarwal, & Mukherjee, Bull. Bot. Surv. India 8: 65. 1966; Moldenke, Résumé Suppl. 15: 16. 1967.

Rao, Aggarwal, & Mukherjee (1966) cite Rao 2062 as this variety.

AVICENNIA MARINA var. RESINIFERA (Forst.) Bakh.

Additional synonymy: Avicennia officinalis Auct. ex Allan, Fl. N. Zeal. 1: 961, in syn. 1961 [not A. officinalis Auct. ex Cuf., 1962].

Additional bibliography: A. Cunn., Ann. Nat. Hist., ser. 1, 1: 461. 1838; R. T. Baker, Journ. & Proc. Roy. Soc. N. S. Wales 49: 257--281, pl. 27--48. 1915; J. G. Wats., Malay. Forest Rec. 6: 115. 1928; Allan, Fl. N. Zeal. 1: 961. 1961; Guillaumin, Thorne, & Virot, Univ. Iowa Stud. Nat. Hist. 20 (7): 45. 1965; T. C. Whitmore, Guide Forests Brit. Solomon Isls. 168. 1966; Studholme & Philipson, New Zeal. Journ. Bot. 4: 355--365. 1966; Studholme & Philipson, Biol. Abstr. 48: 645. 1967; Moldenke, Phytologia 14: 331--335. 1967; Jamieson & Reynolds, Trop. Pl. Types 159, fig. 87. 1967.

Additional illustrations: R. T. Baker, Journ. & Proc. Roy. Soc. N. S. Wales 49: pl. 27--48. 1915; Jamieson & Reynolds, Trop. Pl. Types fig. 87 [as A. officinalis]. 1967.

Studholme & Philipson (1967) report that the secondary thickening in the wood of this species is due to a succession of cambia, each of which functions in a normal manner, but for a limited time. The first of these supernumerary cambia arises by division of the inner derivatives of the preceding cambium. In another genus with included phloem, Heimerliodendron, the secondary thickening is distinctive.

It should be noted here that the A. officinalis Auct. of Cufodontis, mentioned in the synonymy above, is a synonym of typical A. marina (Forsk.) Vierh. The Rechinger & Rechinger 4927 collection is cited by Whitmore (1966) as A. officinalis L. in error.

Additional citations: NEW ZEALAND: North Island: K. Wood 31769 (Ms--43073). Rangototo Island: J. S. Edwards 31838 (Ms--46125).

AVICENNIA MARINA var. RUMPHIANA (H. Hallier) Bakh.

Additional bibliography: Moldenke, Phytologia 14: 331, 333, & 335. 1967.

AVICENNIA OFFICINALIS L.

Additional & emended bibliography: N. J. Anderss., Vet. Akad. Handl. Stockh. 1853: 201. 1854; N. J. Anderss., Galap. Veg. 82. 1859; Boiss., Fl. Orient. 4: 537. 1879; B. L. Robinson, Proc. Am. Acad. 38: 194. 1902; Prain, Bengal Pl., ed. 1, 838. 1903; C. B. Clarke in J. Schmidt, Bot. Tidsskr. 26: 175. 1904; Volkens, Notizbl. Bot. Gart. Berl. 5, App. 22 (2): 36. 1909; Craib, Contrib. Fl. Siam Dicot. 168. 1912; R. T. Baker, Journ. & Proc. Roy. Soc. N. S. Wales 49: 257—281, pl. 27—48. 1915; Haines, Bot. Bihar & Orissa 4: 725. 1922; Gamble, Fl. Presid. Madras 6: 1105 & 1106. 1924; J. G. Wats., Malay. Forest Rec. 6: 57, 58, 66, 68, 99, 115, 116, & 128, pl. 26 & 27. 1928; Watt & Breyer-Brandwijk, Med. & Poison. Pl. S. Afr., ed. 1, 155. 1932; Erdtman, Svensk Bot. Tidsk. 39: 282 & 283, fig. 2. 1945; Bharucha & Shirke, Journ. Bombay Univ. B, new ser., 15 (5): 1—14. 1947; V. S. Rao, Journ. Indian Bot. Soc. 31: [297] & 310—313, fig. 59—63. 1952; S. A. Khan, Pakist. Journ. Forest. 11: 43—45. 1961; Allan, Fl. N. Zeal. 1: 961. 1961; Watt & Breyer-Brandwijk, Med. & Poison. Pl. S. Afr., ed. 2, 1047 & 1360. 1962; Rao, Aggarwal, & Mukherjee, Bull. Bot. Surv. India 5: 143—146. 1963; Prain, Bengal Pl., ed. 2, 2: 626. 1963; Maheshwari & Singh, Dict. Econ. Pl. India 18. 1965; Datta, Handb. Syst. Bot. 181 & 183. 1965; Humbert, Trav. Sect. Scient. & Tech. Inst. Franç. Pond. Hors Ser. 6: 77. 1965; Arora & Aggarwal, Journ. Indian Bot. Soc. 44: 317, 318, & 325. 1965; Guillaumin, Thorne, & Virot, Univ. Iowa Stud. Nat. Hist. 20 (7): 45. 1965; T. C. Whitmore, Guide Forests Brit. Solomon Isls. 168. 1966; Gausson & al., Trav. Sect. Scient. & Tech. Inst. Franç. Pond. Hors Ser. 7: 78 & 96. 1966; Erdtman, Pollen Morph. & Pl. Tax. 448. 1966; C. A. Sm., Common Names S. Afr. Pl. 500 & 600. 1966; G. L. Davis, Syst. Embryol. Angiosp. 271. 1966; Moldenke, Phytologia 14: 328—335. 1967; Van Steenis-Kruseman, Fl. Males. Bull. 4: xlviii. 1967; Moldenke, Résumé Suppl. 15: 8 & 16. 1967; Jamieson & Reynolds, Trop. Pl. Types 159. 1967.

Additional & emended illustrations: J. G. Wats., Malay. Forest Rec. 6: pl. 26 & 27. 1928; Erdtman, Svensk Bot. Tidsk. 39: 282, fig. 2. 1945; V. S. Rao, Journ. Indian Bot. Soc. 31: 310, fig. 59—63. 1952; S. A. Khan, Pakist. Journ. Forest. 11: 45 [in color]. 1961.

Rao, Aggarwal, & Mukherjee (1963) record this species from Pumurichan and Krusadi Islands, India. Clarke (1904) regards Bontia germinans L. as a synonym of A. officinalis. Khan (1961) records the vernacular name "timar" applied to this plant in Pakistan. Datta (1965) says that the bark is used in tanning and the green fruit is used as a poultice in the treatment of boils. Arora & Aggarwal (1965) state that A. officinalis grows along with Rhizophora mucronata, Aegiceras corniculatum, and Ceriops tagal in seaside mangrove forests and also dominates the back-